Informe Final 2009-II

Red virtual aplicada a la manipulación remota de equipos de microscopía y servidores de última generación: GRID teórico-experimental de laboratorios compartidos en Nano y Biotecnología: Consolidación de la red virtual de laboratorios interdisciplinarios

La labor de esta GRID estará soportada por el trabajo interdisciplinario de varios grupos de investigación de la UNAM, el IPICYT y por supuesto del propio IMP. En esta fase del proyecto, uno de nuestros propósitos fundamentales es el de crear un protocolo de acceso para que los miembros de la red puedan acceder a las sesiones de equipo virtual mediante un protocolo IP seguro. Así aunque las sesiones sean una vez por semana en cada uno de los equipos de caracterización involucrados, podremos realizar la conexión de forma expedita y con protocolos de seguridad.

1.- Se desarrollo un protocolo de seguridad para los miembros de la red. Los equipos del IPICyT-IFUNAM-IMP están interconectados a través un protocolo IP seguro.
2.- Se Instalaron de 2 servidores cada uno con cuatro núcleos dobles, en el Instituto de Física de la UNAM. Se está trabajando en el primer Laboratorio Virtual de microscopía computacional y se ha registrado como aplicación en EELA.

Se publicaron los siguientes artículos con miembros de la red:

1. Synthesis and growth mechanism of One-dimensional Zn/ZnO Core-Shell Nanostructures in Low-temperature Hydrothermal Process. Trejo, Martin; Santiago, Patricia; Sobral, Hugo; Rendon, Luis; Pal, Umapada. Crystal Growth & Design cg-2008-001493.R1. (2009). *Cryst. Growth Des.*, **2009**, *9* (7), pp 3024–3030.
2. SEM and HRTEM analysis of ZnS nanoflakes produced by a simple route. Gayou, V. L., Salazar-Hernandez, B., Zavala, G., **Santiago, P**., Ascencio, J. A. APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING Volume: 94 Issue: 4 Pages: 735-738 Published: MAR 2009.
3. An empirical approach to calculate the number of atoms in column-domains by HAADF-STEM analysis: A binary approximation in the $Nb_{16}W_{18}O_{94}$ ternary system. L. Rendon and **P. Santiago**. Journal of Scanning Probe Microscopy.Vol. 3, 36–41 (2008)

Participación en el evento:

Remote Electron Microscopy for In Situ Studies

March 31 – April 1, 2008
Hoff Conference Room
Durand 450
Stanford University

The Tinker Foundation is helping to sponsor a workshop on “Remote Electron Microscopy for In Situ Studies”. This meeting, organized by Tinker Visiting Professor Guillermo Solorzano and Professor Robert Sinclair, would take place March 31 – April 1, 2008 and would bring together a number of notable specialists from the U.S., Europe, Japan and Latin America.

The electron microscope is the most powerful analytical tool to study and to understand materials at the nano-scale. In fact, it was exactly such an instrument that revealed the details of carbon nanotubes that led to the burgeoning field of nanotechnology. One of the major conundrums concerns the fact that as the electron microscopes become increasingly more powerful, their cost has risen so high that fewer scientific laboratories can afford to purchase them, a situation clearly exacerbated in the developing countries. One remedy to allow more widespread usage of these specialized instruments is by “remote access” whereby a researcher in a distant location can operate the microscope at the host laboratory and so obtain data not otherwise possible. With the ever increasing power of personal computers, and the available speed and bandwidth, this is now becoming an ever more attractive option. Some laboratories have now set up these capabilities, mainly for educational outreach.

The purpose of this workshop would be to identify optimum strategies to incorporating remote access more widely. At the same time, we would confer with representatives from the leading electron microscope groups in Latin America who would be able to take greatest advantage of this development. At one stroke, the participants will then be exposed to each other’s best practices and experiences, and productive scientific collaborations are likely to ensue, on an intercontinental basis.

The program will run over two days, with a morning and afternoon session both days. It will be held at a location at Stanford whereby the presenters can demonstrate “live” how their individual systems work. Included are the major microscope manufacturers so that the scientists can hear the developments from their industrial counterparts. The final period will be devoted to a brainstorming session to identify best practices in this rapidly developing approach.